Supplementary Figures

a

|	2.1 - 2.7	2.8 - 2.14	2.15 - 2.21	2.22 - 2.28	2.29 - 3.6	3.7 - 3.13
On-site F2F clinics						
Emergency[1]	X	X	X	X	X	X
Comprehensive clinic[2]	-	-	X	X	X	X
Specialist clinics						
Retina	-	X[3]	X[4]	X[4]	X[5]	X[5]
Cornea and external disease	-	X[3]	X[4]	X[4]	X[5]	X[5]
Glaucoma	-	X[3]	X[4]	X[4]	X[5]	X[5]
Trauma	-	-	X[4]	X[4]	X[5]	X[5]
Orbital disease and oculoplastics	-	-	X[4]	X[4]	X[5]	X[5]
Refractive surgery and optometry	-	-	-	-	X[5]	X[5]
Cataract	-	-	-	-	X[5]	X[5]
Strabismus and amblyopia	-	-	-	-	X[5]	X[5]
Internet hospital						
AI chatbot[6]	X	X	X	X	X	X
Virtual live consultation[7]	X	X	X	X	X	X
Online pharmacy[8]	-	-	X	X	X	X

b
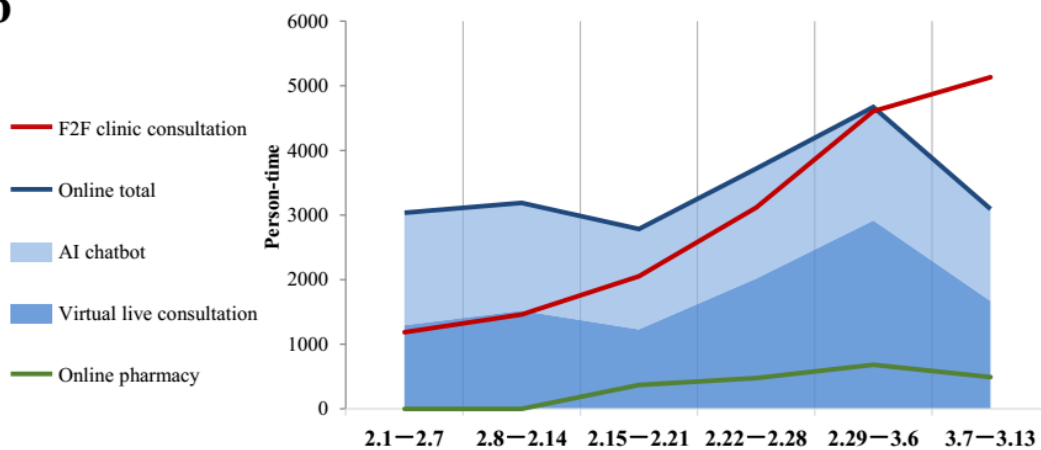
Figure S1. Dynamic changes for the services provided and the number of visits of ZOC online and on-site clinics in response to the control of COVID-19 from February 1 to March 13, 2020. **a,** The gradual reopening of on-site F2F clinics and internet hospital services:

1. Emergency never stopped but opened exclusively for patients suffering from acute trauma, sudden ocular pain or sudden visual loss.

2. Comprehensive clinic was reopened for limited number of appointments form the 3rd week, dealing with most first-visit or postoperative patients for a broad range of eye problems.

3. Specialist clinics reopened gradually from the 2nd week. From Feb 8 to Feb 14, specialists from retina, cornea and glaucoma department were arranged back to clinics in case of surgeries in emergency, including corneal perforation, angle-closure glaucoma, recent retinal detachment, etc. It was not opened to public for appointment yet.

4. Specialist clinics were reopened with limited number of appointments from the 3rd week. Critical cases for rapid treatments were recommended to visit, including recent fundus hemorrhage, keratitis, uncontrolled glaucoma, traumatic iritis, retinoblastoma, etc.

5. Broadened range of specialist clinics were reopened, while, increased number of appointments were allowed from the 5th week.

6. AI chatbot and image recognition platform was established since Feb 1st as optional functions for patients. The AI chatbot was constructed based on natural language processing. Datasets used to train the algorithm covered frequently asked clinical questions and guided services for ophthalmic patients, which were set up according to 11 subspecialties in ophthalmology. The AI image recognition system was based on a previously established diagnostic algorithm utilizing Faster-RCNN model. The system could detect ocular lesions including conjunctival congestion/ hemorrhage, keratopathy, and cataract via ocular surface photos. Prior to COVID-19 crisis, the AI chatbot and the image recognition system were tested through computer modeling and showed promise, however, had not previously been validated.

7. Virtual live consultation were provided by 127 ophthalmologists from ZOC and collaborative hospital in China. In accordance with the regulations issued by the National Health Commission of the People's Republic of China, the intended

subjects include follow-up patients with relatively stable medical conditions but who require regular maintenance of medications, such as those after retinal surgery; and patients with eye discomfort who require non-urgent consultation. Online services a not applicable for patients with medical problems that require urgent treatment, including but not limited to ocular trauma, perforated corneal ulcer, and newly occurring retinal detachment. Prescriptions are not provided for patients being evaluated for the first time online. Patients in need were directed to instructions for using the mini program at the social media app "Wechat" for an appointment. Basically, the patients could communicate with doctors by text and upload photos; a telephone or video visit was also available if necessary. The specialists could log into the platform through their cell phones or computers to provide diagnoses, issue prescriptions, issue a referral to other specialists, or advise patients to seek an on-site F2F consultation with a doctor.

8. Online pharmacy was launched since Feb 17 based on blockchain technology. Blockchain was deployed to maintain the multi-step drug-related workflow open, transparent, and safe, with all information encrypted and recorded on the chain.

b, The number of services by week online (AI chatbot, virtual live consultation, online pharmacy) and on-site (F2F clinic consultation) in the Zhongshan Ophthalmic Center.
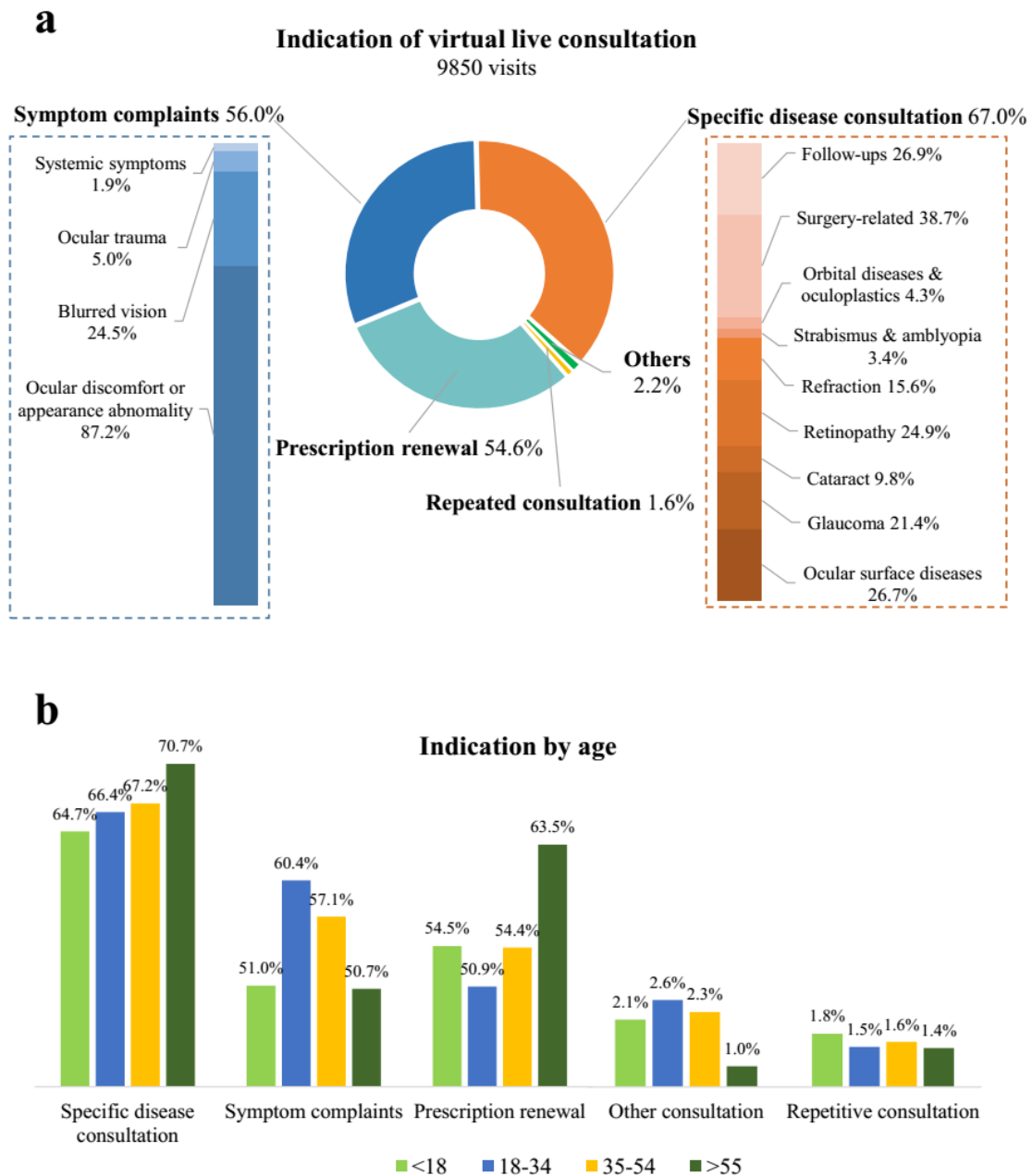
a

Indication of virtual live consultation
9850 visits

Symptom complaints 56.0%

- Systemic symptoms 1.9%
- Ocular trauma 5.0%
- Blurred vision 24.5%
- Ocular discomfort or appearance abnomality 87.2%

Specific disease consultation 67.0%

- Follow-ups 26.9%
- Surgery-related 38.7%
- Orbital diseases & oculoplastics 4.3%
- Strabismus & amblyopia 3.4%
- Refraction 15.6%
- Retinopathy 24.9%
- Cataract 9.8%
- Glaucoma 21.4%
- Ocular surface diseases 26.7%

Others 2.2%

Prescription renewal 54.6%

Repeated consultation 1.6%

b

Indication by age

Specific disease consultation: 64.7%, 66.4%, 67.2%, 70.7%
Symptom complaints: 51.0%, 60.4%, 57.1%, 50.7%
Prescription renewal: 54.5%, 50.9%, 54.4%, 63.5%
Other consultation: 2.1%, 2.6%, 2.3%, 1.0%
Repetitive consultation: 1.8%, 1.5%, 1.6%, 1.4%

■ <18　■ 18-34　■ 35-54　■ >55

Figure S2. The indication of the virtual live consultations in the ZOC internet hospital. a, The analysis of indications for the total virtual live visits. Doughnut chat in the middle shows the relative proportion of each indication (9850 total visits as the denominator); "Symptom complaints" and "specific disease consultation", as the most common cited indications, are subcategorized and displayed as columns on the side (5512 and 6597 visits as the denominator, respectively). Each category of indications is extracted and calculated independently, while, more than one indications can present

in a single visit. **b,** The indication of virtual live visits varied by age (the sum visits for each age period as the denominator, respectively: 2069 visits for "<18 years old"; 3539 visits for "18-34 years old"; 2643 visits f or "35-54"; 1599 visits for ">55 years old").